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25X1A

Contract No. [REDACTED]

APPENDIX I - REV. 18 Nov. 1957

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Item No.	Description	QTY.	Unit Price	Total Price
1(15293) 4(15315)	1 Camera Model HR-818, #818610, in accordance with the attached specifications entitled "Hycon Model HR-818 Camera System Project Plan dated 28 August 1957 as revised 10-15-57 and 11-18-57, each camera to include the following: One (1) Camera Body Model HB-818, #818660 One (1) Magazine Model HM-818, #818760 One (1) Shutter Model HS-818, #818810 One (1) Lens Housing Assembly Model HL-818, #818680	5	[REDACTED]	[REDACTED]
1(15293) 4(15315)	2 Magazine Model HM-818 Spare, #818760	5	[REDACTED]	[REDACTED]
1(15293)	3 Shutter Model HS-818 Spare, #818810	1	[REDACTED]	[REDACTED]
4.	Operation and Service Handbooks, commercial quality.	25 (Amend 2)	[REDACTED]	[REDACTED]
5.	Transportation costs to be reimbursed in accordance with Section C of the Schedule		estimated	[REDACTED]
6. } 7. }	Subamend 2 for these added items. E.C.			
	TOTAL			
8 - added by Amend 3. E.C.				
<u>Delivery Schedule</u>				

- Item 1 - 1 ea. within six (6) months after receipt of the GFE by the Contractor.
4 ea. within one (1) month after delivery of the first unit.
- 2 - 5 ea. { within one (1) month after delivery of the first unit under
- 3 - 1 ea. { Item 1.
- 4 - 5 ea. concurrent with each camera under Item 1.

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SECRET(1st. Rev. 10-15-57)
(2nd Rev. 11-18-57)HYCON MODEL HR-818 CAMERA SYSTEM
PROJECT PLAN

28 August 1957

1.1 DESCRIPTION

The Hycon Model HR-818 Camera System basically is a modification of the K-18 camera to utilize Hycon equipment and to operate with 390 feet of standard base film at shutter speeds of 1/170 second and 1/240 second. The HR-818 will be capable of operating with approximately 750 feet of thin-base film when it is available. The configuration includes the following:

- (a) Hycon Model HR-818 Camera body including the HL-732 lens.
- (b) Hycon Model HM-818 Magazine.
- (c) Hycon Model HS-818 Shutter.

1.2 SPECIFICATIONS

1.2.1 Hycon Model HR-818 Camera Body (Modified K-18 camera body)

- 1.2.1.1 The HL-732 lens replaces the present lens in the K-18 body and is a 24-inch, f/8 Pentac lens (G.F.E.) mounted in a cast aluminum housing in such a manner that the HS-818 shutter can be inserted between the lens elements.
- 1.2.1.2 The coupling at the magazine mating surface is to have a capability of 80 inch-pounds of torque output.
- 1.2.1.3 The data chamber will include a clock, counter, a data card, and a lens element. The unit will be accessible from both inside and outside the camera body.
- 1.2.1.4 The electrical cable for the shutter will be inside the camera body.
- 1.2.1.5 The lens housing will be mounted in such a manner that the shutter can be inserted from either the front or rear to allow for clearance.
- 1.2.1.6 The K-18 case drive will be modified to provide a cycle time of 1.6 seconds at 24 VDC and operates in the range of 24-29 VDC.
- 1.2.1.7 Mounting bosses similar to those on the HR-731 camera will be added to the camera body.
- 1.2.1.8 An electrical connector shall be provided in the camera body consisting of AN3102-10-6P in which A is ground, B is 28 volts DC and C is 28 volts pulse.
- 1.2.1.9 *See attached letter of transmittal dated 19 Dec 1957*
The interconnecting cable between camera body and magazine shall be provided as a pendant cable from the camera body. This cable shall conform to specifications covering pendant cables. WCL

1.2.2 Hycon Model HM-818 Magazine (Modified A8-B Magazine)

- 1.2.2.1 The HM-818 magazine is capable of cycling as fast as 1.1 seconds.
- 1.2.2.2 The HM-818 magazine operation will require less than 50 inch-pounds of torque input at the coupling.
- 1.2.2.3 The HM-818 magazine will accommodate 390 feet of standard base film or approximately 750 feet of thin base film.

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- 1.2.2.4 The vacuum system shall be capable of handling a range of 1" Hg (min.) to 10" Hg (max.) through a 3/8 I.D. hose.
- 1.2.2.5 The HM-818 magazine will be mechanically and electrically interchangeable with the HM-732 magazine.
- 1.2.2.6 The HM-818 magazine will incorporate parallel wiring of the indicator circuit.
- 1.2.2.7 The HM-818 magazine will use ^{one} 7-pin electrical ^{power} connectors, and one 2-pin ~~signal light~~ connector. (WOW)
- 1.2.2.8 The platen will be contoured to conform to the characteristics of the HL-732 lens. Its position and tolerances will be the same as in the HM-732 magazine.
- 1.2.2.9 The brake and clutch cams in the gear case will be replaced by the improved design used in the HM-732 magazine.
- 1.2.2.10 The selective switch actuating cam will be reworked for better action.
- 1.2.2.11 The heater and thermostat in the magazine shall not be deleted. They may be relocated within the magazine if necessary.
- 1.2.2.12 An end-of-film switch will be incorporated in the HM-818 magazine.
- 1.2.3 Hycon Model HS-818 Shutter (Modified Hycon Model HS-732 Shutter)
- 1.2.3.1 The aperture size is 3-1/2 inches in diameter.
- 1.2.3.2 The shutter speed is 1/240 seconds \pm 20%. Lower rate springs will be provided for a shutter speed of 1/170 seconds \pm 20%.
- 1.2.3.3 The maximum rewind time will be 1.5 seconds at 24 VDC. Average normal rewind on present model is 1.3 seconds at 28 VDC.
- 1.2.3.4 Snap-on Waterhouse stops will provide f/11, f/16 and f/22.
- 1.2.3.5 The connector cable on the HS-732 shutter will be replaced with a plug-in type of 8-pin connector, ~~mounted in rubber~~. (WOW)
- 1.2.3.6 The shutter ~~mounting screws~~ will be rubber-mounted to provide shock isolation. (WOW)
- 1.2.3.7 The HS-818 shutter life cycle is:
 - (a) 20,000 operations before minor overhaul.
 - (b) 80,000 operations before major overhaul.

1.3 DESIGN APPROACH

- 1.3.1 Hycon Model HR-818 Camera Body (Modified K-18 Camera Body)
- 1.3.1.1 All parts that will no longer be used will be removed.
- 1.3.1.2 Four (4) mounting bosses incorporating a 3/8 - 24 tapped hole, identical to those on the HR-731 camera body, will be added.
- 1.3.1.3 The K-18 camera body will be altered to provide clearance for and mounting provisions for the HL-818 lens assembly. Rework of the body will also be required for the installation of the data chamber.

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- 1.3.1.4 The HL-818 lens assembly will consist of a cast aluminum housing in which is mounted the HL-732 lens elements. The housing will have two (2) opposed openings to accept the H3-818 shutter in either of two directions (along or across the flight path as determined on original installation of housing). The opening not in use will be closed by an easily removable cover plate.
- 1.3.1.5 The data chamber will be the one used in the HR-731 camera with a few improvements incorporated. It will be so mounted as to be accessible from either inside or outside the camera body.
- 1.3.1.6 Steel focus post mounting pads similar to those in the HR-731 camera will be added.
- 1.3.1.7 The trip solenoid will be retained to start the case drive motor. The hand trip will be eliminated.
- 1.3.1.8 Lens covers will be provided.
- 1.3.1.9 The K-18 case drive gear box will be altered to provide a 1.6 second cycle time.
- 1.3.1.10 Electrical wiring for the shutter will be inside the camera body.
- 1.3.1.11 Two (2) 8-pin connectors will be provided for installing the shutter from either of two (2) sides.
- 1.3.1.12 The red filter and minus blue filter supplied with the K-18 camera are to be checked for optical flatness and reworked if necessary.
- 1.3.1.13 The camera body will be repainted with a Hycon gray.
- 1.3.1.14 A new Hycon nameplate incorporating Model and Serial numbers will replace the present nameplate.
- 1.3.2 Hycon Model HM-818 Magazine (Modified A8-B Magazine)
 - 1.3.2.1 The clutch and brake discs are to be removed, inspected, lapped if necessary, and reassembled. The spiral springs are to be replaced by a new spring, Hycon part number 731251, for improved brake and clutch action.
 - 1.3.2.2 The clutch arm and brake arm bushings will be machined as necessary to provide proper clutch and brake tension.
 - 1.3.2.3 New clutch and brake cams similar to those used in the HM-732 magazine will be installed.
 - 1.3.2.4 The Geneva drive plate will be pinned and the slots will be burnished. A new Geneva drive bearing (double row, if possible) and pin will be required. SIGNED
JEM
 - 1.3.2.5 The heater and thermostat in the magazine shall not be deleted. They may be relocated within the magazine if necessary.
 - 1.3.2.6 The platen is basically the HM-732 platen modified as follows:
 - (a) Extended mounting rails to prevent snagging of film edge.
 - (b) Addition of bracket to hold end-of-film switch.

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- 1.3.2.7 The gear housing (inner) casting and spool supports will be machined if necessary to clear new platen.
- 1.3.2.8 The counter in the magazine shall not be deleted if there is interference with the new platen but shall be relocated if necessary.
- 1.3.2.9 A new base machining drawing will be required incorporating holes for the platen dowel pins, and two (2) parallel grooves to accept the extended rails on the platen. The minimum distance between the bottom edge of the platen and the base surface (film clearance) will be .022.
- 1.3.2.10 Substitute new spool support bushings if necessary.
- 1.3.2.11 Thin base film application will demand that the platen, rollers, and spindles maintain close alignment.
- 1.3.2.12 A new vacuum valve (similar to the one in HM-732 or HM-731) will be required to operate between 1" Hg and 10" Hg from a 3/8-inch I.D. hose.
- 1.3.2.13 A crutch tip (Hycon part 731202-107) will be added to the T-out on the bridge channel assembly.
- 1.3.2.14 The present knob assembly on the A8-B magazine cover will be modified to make it the same as the one used on HM-732.
- 1.3.2.15 Install parallel wiring for the indicator circuit.
- 1.3.2.16 Provide ^{one} 7-pin electrical connectors, *retain 2-pin signal light connector* (Wew)
- 1.3.2.17 The magazine will be repainted with a Hycon gray fog coating.
- 1.3.2.18 A new Hycon nameplate incorporating model and serial numbers will be required.
- 1.3.2.19 A new wiring diagram and decal will be required.
- 1.3.2.20 An inspection and test check list will be provided.
- 1.3.3. Hycon Model HS-818 Shutter (Modified Hycon Model HS-732 Shutter)
- 1.3.3.1 The electrical cable of the HS-732 shutter will be removed and replaced by ~~a 8-pin connector mounted in rubber on the shutter~~ (Wew)
- 1.3.3.2 Two (2) sets of shutter springs for shutter speeds of 1/170 \pm 20% seconds and 1/240 \pm 20%, seconds will be supplied.
- 1.3.3.3 A hardened steel worm gear will be used to add longer life to the shutter rewind system.
- 1.3.3.4 Snap-on Waterhouse stops for f/11, f/16 and f/22 will be supplied.
- 1.3.3.5 A new Hycon nameplate incorporating model and serial numbers will be provided.
- 1.3.3.6 A new wiring diagram and decal will be provided.
- 1.4 MISCELLANEOUS REQUIREMENTS
- 1.4.1 Camera and magazine carrying cases will be restenciled to reflect the new designations.
- 1.4.2 A carrying case will be provided for ^{each} ~~the spare~~ shutter. (Wew)

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